

CLAIMS

I claim:

1. A contoured structural member, comprising:

at least one contoured inner layer comprising a composite material;

at least one contoured outer layer comprising a composite material; and

wherein an outer surface of the structural member has a polygonal shape.

2. The structural member of claim 1, wherein the structural member has a closed configuration.

3. The structural member of claim 2, further comprising an interior region defined by an inner surface of the at least one inner layer.

4. The structural member of claim 3, wherein the interior region is hollow, partially filled, or completely filled.

5. The structural member of claim 3, wherein the at least one of the composite materials is formed from a prepreg material.

6. The structural member of claim 5, wherein the prepreg material comprises a plurality of layers.

7. The structural member of claim 6, wherein the plurality of layers have a plurality of fibers with an orientation ranging from 0 to about 90 degrees.

8. The structural member of claim 1, wherein the structural member has at least one end with the at least one initiator not located near the at least one end.

9. The structural member of claim 1, further comprising a composite overwrap on a portion of the outer surface of the structural member.

10. A contoured structural member, comprising:

at least one contoured inner layer comprising a composite material;

at least one contoured outer layer comprising a composite material; and

a composite overwrap on a portion of the at least one contoured outer layer;

wherein an outer surface of the structural member has a polygonal shape.

11. A contoured structural member, comprising:

at least one contoured inner layer comprising a reinforced resin matrix material;

at least one contoured outer layer comprising a reinforced resin matrix material; and

wherein an outer surface of the structural member has a polygonal shape.

12. The structural member of claim 11, further comprising a composite overwrap on a portion of the outer surface of the structural member.

13. A contoured structural member, comprising:

at least one contoured inner layer comprising a reinforced resin matrix material;

at least one contoured outer layer comprising a reinforced resin matrix material; and

a composite overwrap on a portion of the at least one contoured outer layer;

wherein an outer surface of the structural member has a polygonal shape.

14. The structural member of claim 13, further comprising a composite overwrap on a portion of the outer surface of the structural member.

15. A method for making a contoured structural member, comprising:

providing at least one inner layer comprising a composite material;

providing at least one outer layer over the at least one inner layer, the at least one outer layer comprising a composite material;

connecting the at least one inner and outer layer to the at least one inner layer; and

providing an outer surface of the structural member with a polygonal shape.

16. The method of claim 15, including providing the at least one inner layer by roll wrapping the at least one inner layer over a substrate.

17. The method of claim 16, including providing the at least one outer layer by roll wrapping the at least one outer layer over the at least one inner layer.

18. The method of claim 17, further including removing the substrate.

19. The method of claim 18, including partially or completely filling the interior created by removing the substrate.

20. The method of claim 19, further including constraining the at least one outer layer and reacting any reactable material of the at least one inner or outer layers prior to removing the substrate.

21. The method of claim 20, including constraining the at least one outer layer by roll wrapping at least one layer of a shrink-wrap material over the at least one outer layer.

22. The method of claim 21, including removing the at least one layer of the shrink-wrap material after the reaction.

23. The method of claim 20, further including providing a plurality of pressure distributors over the at least one outer layer while constraining the outer layer.

24. The method of claim 23, wherein the plurality of pressure distributors provides the outer surface with the polygonal shape.

25. The method of claim 15, further including providing an overwrap over a portion of the at least one outer layer.

26. The method of claim 25, including providing the overwrap by roll wrapping a composite material over said portion.

27. The method of claim 25, further including radially cutting the structural member along the portion containing the overwrap.

28. A method of making a contoured structural member, comprising providing at least one inner layer comprising a reinforced resin matrix material; providing at least one outer layer over the at least one inner layer, the at least one outer layer comprising a reinforced resin matrix material; providing an overwrap over a portion of the at least one outer layer; connecting the at least one inner and outer layer to the at least one inner layer; and providing an outer surface of the structural member with a polygonal shape.

29. A method of making a contoured structural member, comprising roll wrapping at least one inner layer comprising a reinforced resin matrix material over a substrate;

roll wrapping at least one outer layer over the at least one inner layer, the at least one outer layer comprising a reinforced resin matrix material;

roll wrapping an overwrap over a portion of the at least one outer layer;

connecting the at least one inner and outer layer to the at least one inner layer; and
providing an outer surface of the structural member with a polygonal shape.

30. A contoured structural member made by the method comprising:
providing at least one inner layer comprising a composite material;
providing at least one outer layer over the at least one inner layer, the at least one outer
layer comprising a composite material;
connecting the at least one inner and outer layer to the at least one inner layer; and
providing an outer surface of the structural member with a polygonal shape.

31. A contoured structural member made by the method comprising:
providing at least one inner layer comprising a reinforced resin matrix material;
providing at least one outer layer over the at least one inner layer, the at least one outer
layer comprising a reinforced resin matrix material;
providing an overwrap over a portion of the at least one outer layer;
connecting the at least one inner and outer layer to the at least one inner layer; and
providing an outer surface of the structural member with a polygonal shape.

32. A contoured structural member made by the method comprising:
roll wrapping at least one inner layer comprising a reinforced resin matrix material over a
substrate;
roll wrapping at least one outer layer over the at least one inner layer, the at least one
outer layer comprising a reinforced resin matrix material;
roll wrapping an overwrap over a portion of the at least one outer layer;

connecting the at least one inner and outer layer to the at least one inner layer; and
providing an outer surface of the structural member with a polygonal shape.